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Nucleic acid fragments for the identification of bacteria in industrial wastewater bioreactors

Description of Technology: Unique bacterial strains and identifying 16S rDNA sequences have been isolated from activated wastewater sludge. The 16S rDNA sequences are diagnostic for organisms which are key to the health of activated sludge wastewater systems.

Patent Listing:

1. **US Patent No.** 6,608,190**,** Issued on August 19, 2003, "Nucleic acid fragments for the identification of bacteria in industrial wastewater bioreactors"
   http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=6,608,190.PN.&OS=PN/6,608,190&RS=PN/6,608,190

Market Potential: Wastewater biotreatment is a cost effective, environmentally benign technology that is widely used by municipalities and industry to treat municipal waste or process waste. A variety of different processes that use microbes to remove inorganic and organic chemicals from industrial wastewater are known to those skilled in the art. For example, the activated sludge process is one common method. An activated sludge system usually involves a continuous flow process in which wastewater is mixed with sludge and aerated (Bitton, G. 1994. Wastewater Microbiology. Wiley-Liss, New York). The key feature of an activated sludge system is that some sludge is recycled from a settling tank back into the main reactor. The sludge is composed of bacteria and other microorganisms that utilize organic and inorganic chemicals in the wastewater as sources of nutrients and energy for growth. By utilizing the chemicals in the wastewater for metabolism and growth, the microorganisms incorporate the chemicals into new microorganisms and/or convert the chemicals into gases such as carbon dioxide and nitrogen, thereby removing the chemicals from the wastewater. Activation of sludge through recycling maintains a large population of microbes in the main reactor vessel to degrade the waste chemicals.

The problem to be overcome is to rapidly identify microorganisms that may be found in a wastewater bioreactor so that the presence or absence of those microorganisms in the wastewater bioreactor can be monitored. The Applicants have solved the stated problem by identifying some of the bacteria that are present in a wastewater bioreactor and by providing sets of nucleic acid sequences that are unique to various novel bacterial strains that were isolated from an industrial wastewater bioreactor. The present invention has utility in that the provided sets of nucleic acid sequences can be used to identify and monitor the corresponding bacterial strains in samples taken from a wastewater bioreactor or from any environment which might contain the specified bacteria.

Benefits:

- Rapidly identifies microorganisms that may be found in a wastewater bioreactor and monitors them

Applications:

- Wastewater bioreactor health

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